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Information Capacity of a Neural Network with Redundant Connections Between Neurons

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Abstract

© 2017 IEEE. In this work the model of a spiking recurrent neural network where any pair of neurons can form several connection lines (axons) with different spike propagation times is studied. Through simulation modeling, it has been shown that a neural network with redundant connections between neurons in the form of delay lines provides storage and playback of a significant number of independent temporal sequences of neural pulses. It has been suggested that multiple synaptic inputs from a single neuron in a natural neural network provide some of the information-processing properties of the network.

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Keywords

cue pattern, delay lines, memory, polychronization, recurrent neural network, redundant connections, temporal sequences

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